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16. Abstract

Deicing salts and salt-water spray can cause serious corrosion problems for reinforced concrete bridge structures. These problems can lead to costly and labor-intensive repair and even replacement of the structure. Surface applied corrosion inhibitors are potentially a useful and cost effective way to prolong the life of existing structures. The purpose of this research project was to evaluate the effectiveness of commercially available corrosion inhibitors for surface treatments of existing reinforced concrete bridges.

Reinforced concrete specimens were cast with different levels of initial chloride contents, coated with one of six products tested, and placed in accelerated corrosion environments. Each manufacturer donated their corresponding products for use in the experiment. The manufacturers were also given the test matrix and parameters in advance of the product application and invited to participate in the application process. Environmental conditions, voltmeter, and half cell potential readings were taken on a weekly basis in accordance with ASTM standards. Intermittently, some of these specimens were removed from their environments and evaluated on a visual, mass loss, strength loss, and chloride content basis. This data was then compiled and compared to each other and to control specimens located in a non-corrosive environment.

It was found that surface applied corrosion inhibitors delay the onset of corrosion and the speed of the corrosion process. It was also found that a maximum chloride content of 0.5% by cement weight exists beyond which none of the inhibitor products were useful. Suggestions for further research in this area of study are also included.

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